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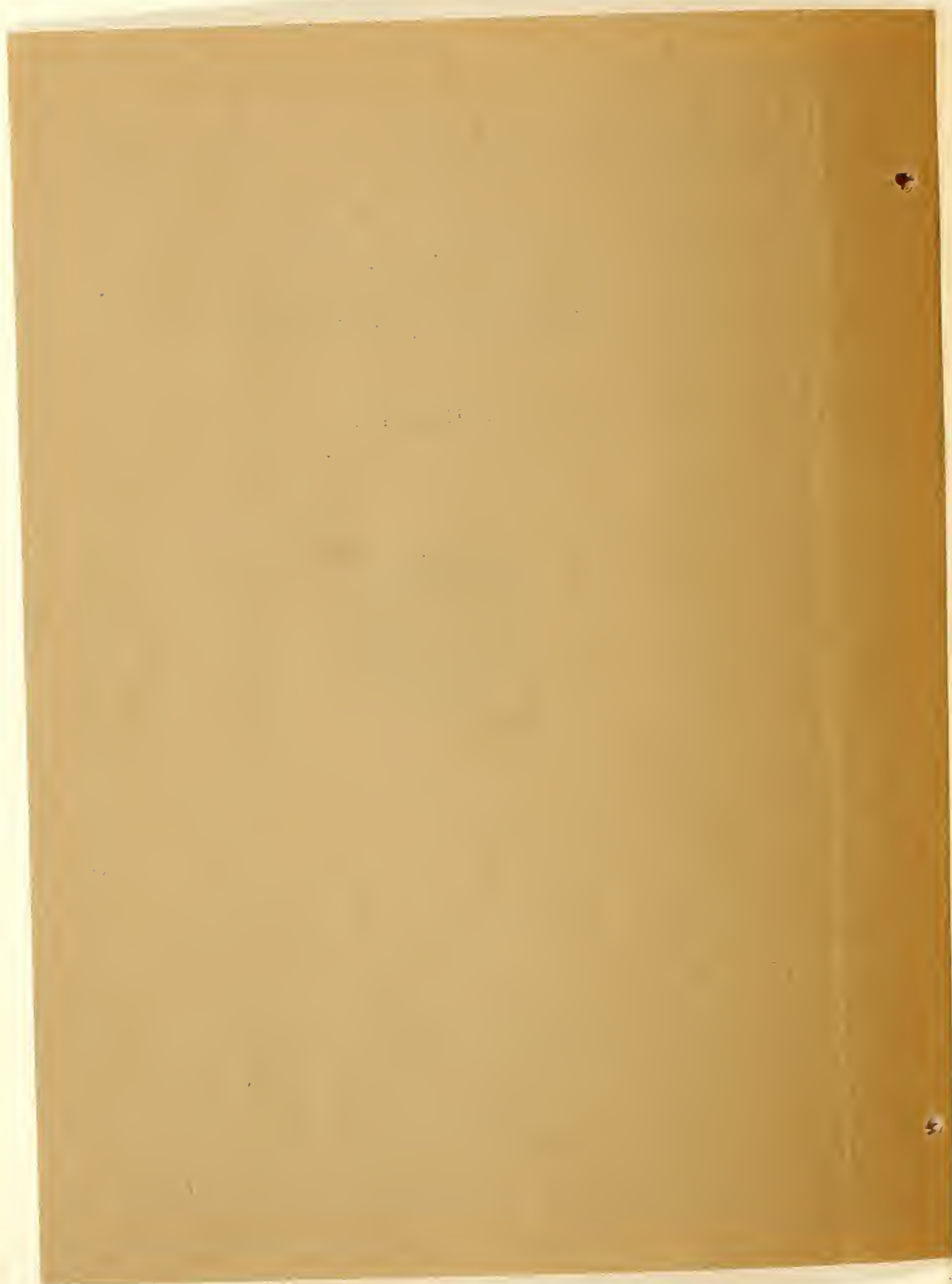
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Film Strips in the Teaching of Agriculture

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FILM STRIPS IN THE TEACHING OF AGRICULTURE*

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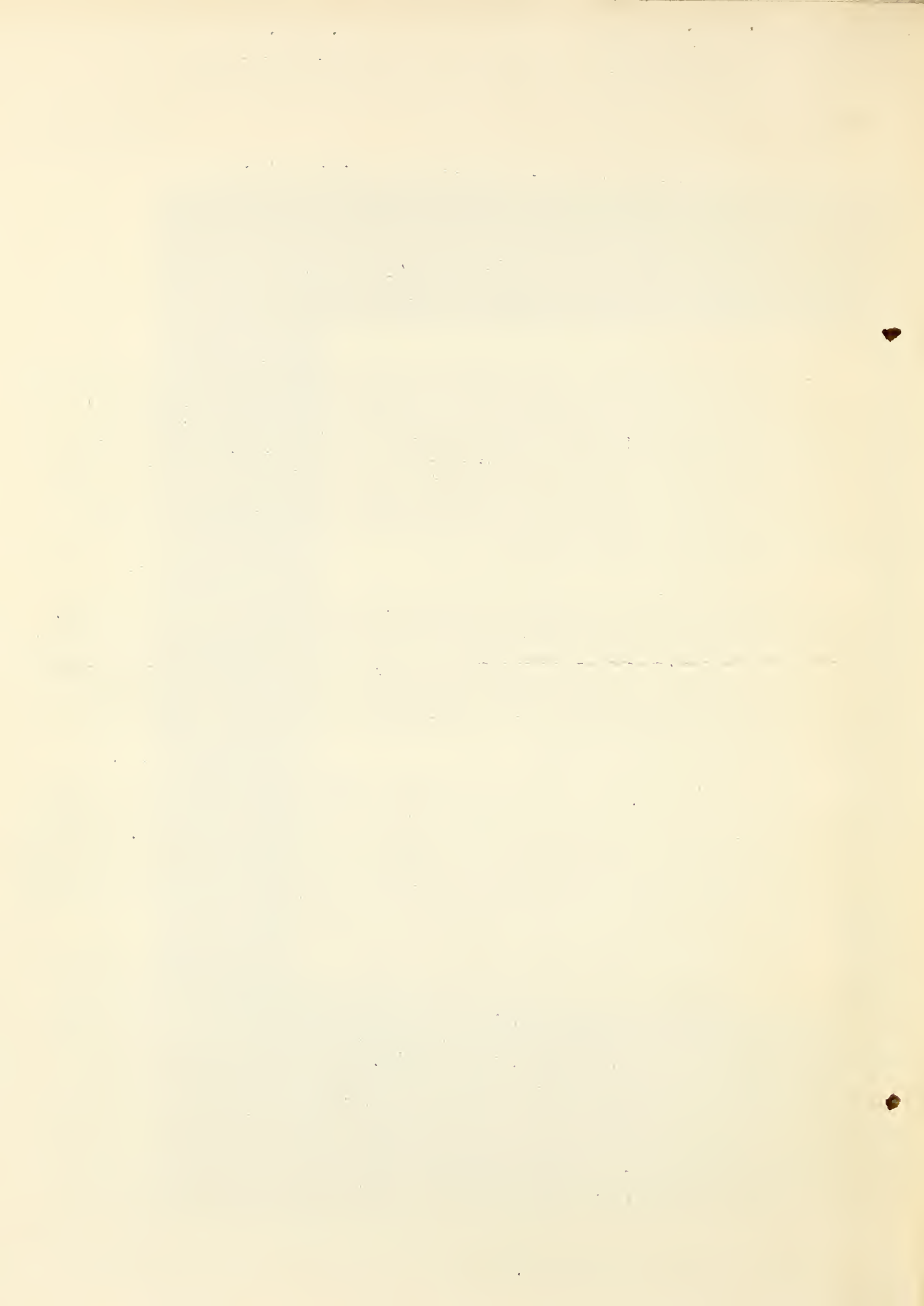
It is no doubt safe to say that every progressive teacher of agriculture agrees that our courses of instruction in agriculture would be greatly enriched if our teachers could be supplied with an adequate quantity of high-quality, timely, and well-adapted illustrative material in practical form for systematic use in their classes. How to accomplish this is a problem. It seems unreasonable to expect that the teachers themselves will ever be able to supply their own needs. A rather careful study of the problem indicates that the most practical solution lies in having the needed illustrative material very largely supplied through some State agency.

Until recently the accomplishment of such an aim has been far from easy in many States. Motion pictures are expensive, difficult to handle, and the supply of suitable films is small. On the other hand, glass slides are heavy, bulky, inconvenient, easily broken, and rather expensive. Film strips, however, seem not only better adapted to this purpose than either motion pictures or glass lantern slides, but promise to revolutionize the field of visual instruction as applied to agriculture, by increasing the availability and use of localized illustrative material.

The film strip can be made up in large numbers at low cost. It is convenient to handle in filing, shipping, and in the schoolroom. It is practically nonbreakable. In other words, the film strip is a convenient and inexpensive means of supplying a large number of individual teachers with uniform, thoroughly prepared, and up-to-date illustrative material for systematic use in the classroom. Any visual medium of expression which has such advantages as these merits the careful consideration of both teachers and supervisors.

The low cost of film strips makes a strong appeal to those who use them. Take for instance the 93 film-strip series of the United States Department of Agriculture. Arrangements have been made whereby extension workers or other individuals, institutions or organizations may be authorized by the Department of Agriculture to purchase from a commercial manufacturer at contract prices prints of these series on motion-picture film. Under the contract for the fiscal year 1930-31 these prices range from 35 cents for an entire series of 48 frames or slides to 71 cents for an entire series of 112 frames. It is of interest to note that about 90 per cent of these film strips contain less than 65 frames or slides each and that the maximum price per film strip of these series is 44 cents. To put it in another way, if a 64-frame film strip which sells for 44 cents were to be made up into glass slides at 30 cents each the

*A revision of Extension Service Circular 95, Filmstrips in the Teaching of Agriculture, issued in January, 1929.



cost would be \$19.20 plus transportation. In view of these low prices it is not surprising that the demand for the purchase of these film strips is increasing rapidly.

During the fiscal year which ends on June 30, 1931, the department has a contract with the Consolidated Film Industries (Inc.), 1776 Broadway, New York City, for the making of film-strip negatives and positives from material which we submit. State workers desiring to have their own local photographs, charts, and other visual material reproduced in film-strip form may take advantage of the contract which the department has with this firm. In accordance with the terms of our contract, the firm will make a film-strip negative at 25 cents per frame. This price includes one positive from each negative. The cost of additional positive prints of a series depends on the number of frames, as follows:

Cost of 48 frames or less would be 35 cents for each strip;
49 to 64 frames would be 44 cents for each strip.
When the strip involves 65 or more frames, each additional
16 frames or fraction thereof would cost 9 cents.

The cheapest method of making negatives for film strips is to make the exposures directly on motion-picture film in a special, small hand camera. One 50-exposure roll of film for use in the most popular of these cameras retails at 50 cents. Development of the film costs from 10 to 25 cents. Thus the cost of the negative need not exceed 75 cents. The price of the cameras especially designed for the making of such negatives varies from \$20 to \$105. The film strips obtained in this way are usually not so good as those made from high-class photographs. Those who use this method should be careful to expose correctly, to use their camera on a tripod as much as possible, and to compose each subject carefully so as to include only the important thing desired.

Another advantage of the film strip is its portability. Fifty glass lantern slides packed for shipment weigh about 15 to 16 pounds. A film-strip of the same number of illustrations, packed ready for shipment, weighs only a few ounces and can be shipped by mail for a few cents to any part of the country. In addition there are no losses due to breakage in shipment.

Minor advantages of film strips are: (1) The illustrations always appear upright and in the correct order; (2) breakage in handling, projecting, and shipping is reduced to the minimum; (3) they are much more convenient to handle than glass slides; (4) filing them is much simpler and requires less space than for glass slides.

For professional use film strips seem to have possibilities which are limited only by the ingenuity of the person using them. Personally, I believe that they offer an exceptional opportunity for the improvement of present methods of presenting statistical data, and that they can in no small measure be used successfully as a substitute for motion pictures in illustrating the steps in a process such as transferring bees, grafting, budding, or pruning.

Like every other type of illustrative material, however, the film strip has its shortcomings. The order of the illustrations is fixed, and rearrangement or the introduction of supplementary illustrations is therefore not practicable.

Many users of lantern slides consider this an advantage, but the specialist and others thoroughly familiar with the subject will often desire to rearrange or omit some of the illustrations and to supplement others.

The film strip can be colored but it is not generally advisable. The size of the frame being only three-quarters by 1 inch, the detail is so small that it is impracticable to color it accurately and there is no means of protecting the colored surface against injury.

Although film strips do not break like glass slides, they are readily scratched. Excessive scratches appreciably detract from the pleasure of viewing the pictures. Every possible precaution should be taken to avoid damage to the film. The projector should be kept free of dust and dirt, and special care should be taken to keep perfectly clean every surface of the projector which comes in contact with the film. It is also advisable to avoid unnecessary and rapid running of the film through the projector. To reduce damage to the film, always handle it by the edges. If the film does become soiled it may be cleaned with a solution of carbon tetrachloride applied with a wad of absorbent cotton.

The small size of the frame - only three-quarters by 1 inch as contrasted with about $2\frac{3}{4}$ by 3 inches on the glass slide - introduces two other difficulties: (1) The unsatisfactory effect of great enlargement and (2) the problem of supplying adequate illumination in projection. Whenever a photographic image is greatly enlarged the grain in the emulsion becomes visible, and the greater the degree of enlargement the more evident and displeasing is this effect. The problem of supplying adequate illumination is much more difficult than for glass slides because of two limiting factors: (1) The size of the aperture through which the light passes and (2) the power of the electric lamp used. It is evident that the larger the aperture the more light can be sent through it; and that the danger of setting fire to the film sets a limit to the size of the lamp which may be used.

Although these disadvantages do exist they will not be so serious as they seem if proper precautions are taken to minimize their effects. Use only illustrations of the highest quality, avoid using a larger screen image than is absolutely necessary, and purchase the highest type of projector that can be afforded.

Although the quality of a well-made film strip prepared from choice illustrations or direct from a high-grade original negative is surprisingly good, frankness compels the admission that, other things being the same, the results obtained are not the equal of those obtained from glass slides. There are two principal reasons for this superiority of the glass slide: (1) The much larger size of the image and (2) the fact that the slides are individual permits the selection of the materials and technical methods best adapted for the perfect reproduction of each illustration. Except in exposure, there is practically no opportunity to give individual treatment to the illustrations of a film strip. Herein lies the great difficulty in the making of film strips, and this fact should be kept in mind by those who select and prepare illustrations for film strips.

Satisfactory results can not and should not be expected from the use of lantern slides that are illegible or of poor photographic quality. Good slides can be made only from good negatives. It being appreciably more difficult to obtain high quality in film strips than in glass slides, special need arises to provide the maker of film strips with illustrations of the very best quality. Photographic prints should be sharp, clear, full of detail, be printed on glossy paper, and be ferrotyped. All prints should be made from the original negatives.

Legibility is of primary importance in the case of charts and drawings of all kinds. For a film strip chart to show up clearly it is absolutely necessary that all letters and figures be large and of bold type and that all lines in drawings shall be heavy enough to stand out clearly after reduction. Best results are usually obtained with a good black India ink on a pure white background.

The most effective charts are simple and concise. A film strip chart should contain few words, not more than 50. Most charts contain too much subject matter and tell too many things. In the preparation of such material it is well to begin by omitting all nonessentials and if that is not sufficient, to divide the subject matter into two or more charts.

A good title aids the student to acquire a quick grasp of the significance and meaning of a chart. Good titles are brief, accurate, and clear. No title should exceed 10 to 12 words.

Uniformity of size of copy is not essential, but it is of great advantage to the photographer in obtaining the best results because it reduces the number of opportunities for error. It also reduces the time required to do the work. For these reasons the most convenient and practical method of making film strip negatives is to copy prints of uniform size. A certain amount of reduction usually improves the result, and therefore 5 by 7, $6\frac{1}{2}$ by $8\frac{1}{2}$, or 8 by 10 inch prints are to be preferred to smaller prints.

Another important thing to bear in mind when preparing or selecting illustrations for film strips is the proportion of the material. As will be recalled, the aperture of the standard projector is approximately three-quarters of an inch high and 1 inch wide. Therefore, if the illustration is to fill that space, its proportion must be such that it is 3 units high and 4 units wide. An exception should be noted here. One nonstandard projector has an aperture of approximately 1 by $1\frac{1}{2}$ inches and the picture may be shown either vertically or horizontally. The fact to be emphasized here is that long, narrow prints, whether horizontal or vertical, occupy so little of the frame that they usually reproduce unsatisfactorily. When photographs are taken for use in film strips the proportions should be made as near those of the film strip as possible.

The visual instruction and editorial division of the Office of Cooperative Extension Work, United States Department of Agriculture, will be pleased to supply more detailed information on the selection and preparation of illustrations for use in film strips.

The first part of the report deals with the general situation of the country. It is a very interesting and informative study of the country's development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's development.

The second part of the report deals with the economic situation of the country. It is a very interesting and informative study of the country's economic development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's economic development.

The third part of the report deals with the social situation of the country. It is a very interesting and informative study of the country's social development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's social development.

The fourth part of the report deals with the political situation of the country. It is a very interesting and informative study of the country's political development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's political development.

The fifth part of the report deals with the cultural situation of the country. It is a very interesting and informative study of the country's cultural development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's cultural development.

The sixth part of the report deals with the environmental situation of the country. It is a very interesting and informative study of the country's environmental development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's environmental development.

The seventh part of the report deals with the international situation of the country. It is a very interesting and informative study of the country's international development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's international development.

The eighth part of the report deals with the future of the country. It is a very interesting and informative study of the country's future development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's future development.

The ninth part of the report deals with the conclusion of the study. It is a very interesting and informative study of the country's development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's development.

The tenth part of the report deals with the bibliography of the study. It is a very interesting and informative study of the country's development. The author has done a great deal of research and has gathered a wealth of material. The report is well written and is a valuable contribution to the study of the country's development.



